

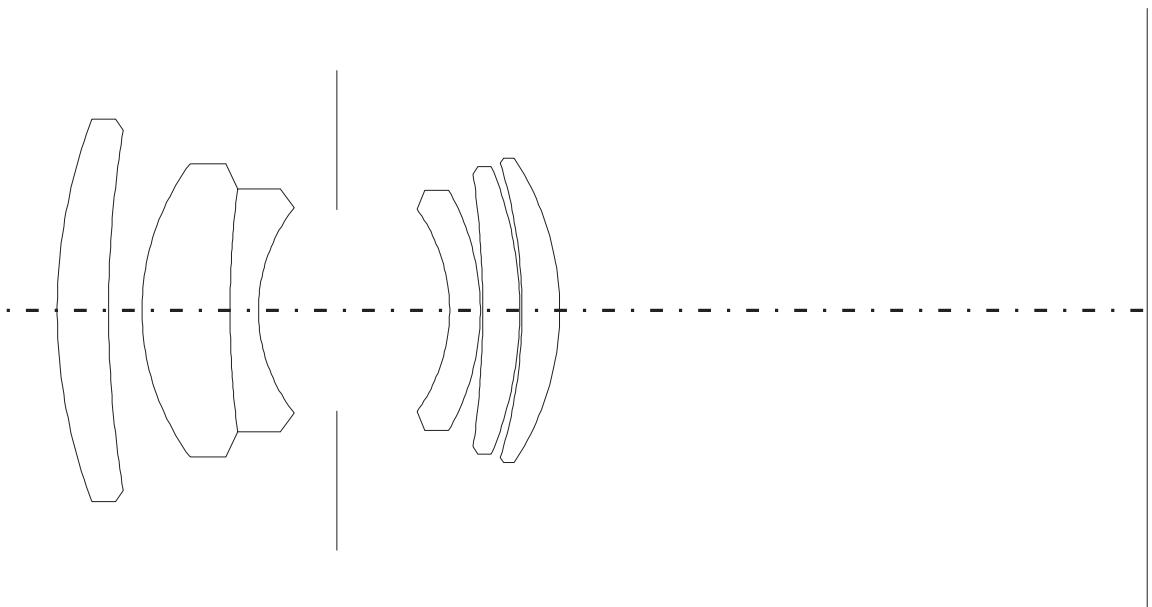


# LEICA MACRO-ELMARIT-R 60 mm f/2.8



Excellent image quality in the close-up range, outstanding sharpness and fascinating detail fidelity are a matter of course for this lens. Stopping the lens down by one or two stops results in superb results at greater distances as well. It is also flare-free, even under difficult lighting conditions. Vignetting and distortion are practically non-existent. With its focal length of 60 mm, it has a particularly versatile range of applications. When high speed can be foregone at this focal length in order to gain a focusing range from infinity down to 27 cm, a reproduction ratio of 1:2, this lens is the perfect choice. An even closer reproduction ratio of 1:1 can be achieved in combination with the LEICA MACRO-ADAPTER-R.

## — Lens shape



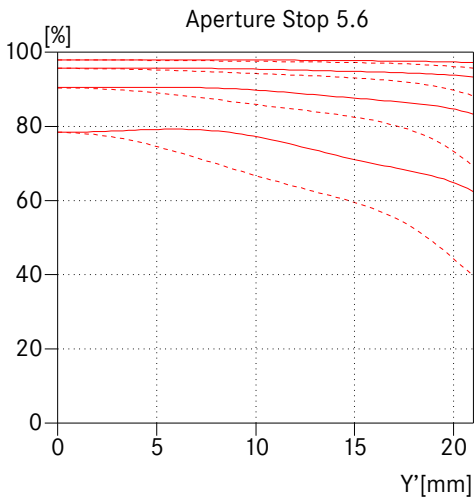
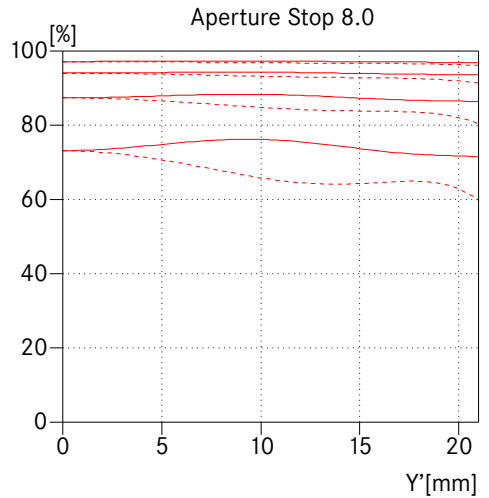
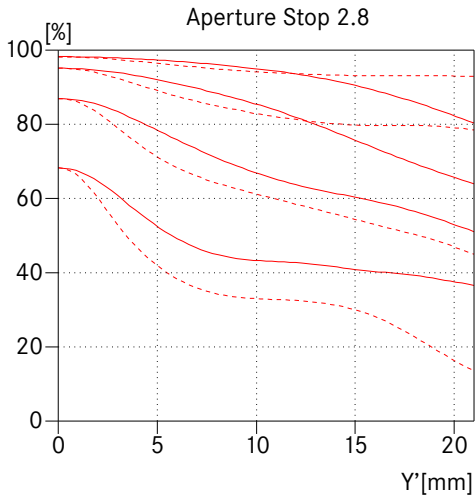


— Engineering drawing

### Technical Data

|   |   |
|---|---|
| <b>Angle of view (diagonal, horizontal, vertical)</b> | 40°, 33°, 23°   |
| <b>Optical design</b>                                 | <b>Number of elements / groups:</b> 6 / 5<br><b>Focal length:</b> 61.4 mm<br><b>Entrance pupil:</b> 24.2 mm (related to the first lens surface in light direction)<br><b>Focusing range:</b> 0.27 m to Infinity, with MACRO-ADAPTER-R 0.23 - 0.18 m |
| <b>Distance setting</b>                               | <b>Scale:</b> Combined meter/feet-increments<br><b>Smallest object field:</b> 48 mm x 72 mm<br><b>Highest reproduction ratio:</b> 1:2, with MACRO-ADAPTER-R 1:1   |
| <b>Diaphragm</b>                                      | <b>Setting / Type:</b> Preset diaphragm with clickstops (including half values), Fully automatic diaphragm, also the case with MACRO-ADAPTER-R<br><b>Smallest aperture:</b> f/22  |
| <b>Bayonet</b>  | LEICA R quick-change bayonet for LEICA R3 to LEICA R9 with mechanical, and, for LEICA R8/R9, additional electronic exposure control   |
| <b>Filter (type)</b>                                  | Internal thread for screw-in type filters E 55  |
| <b>Lens hood</b>                                      | Built-in, telescopic  |
| <b>Dimensions and weight</b>                          | <b>Length:</b> 62.3 mm<br><b>Largest diameter:</b> 67.5 mm<br><b>Weight:</b> approx. 400 g  |

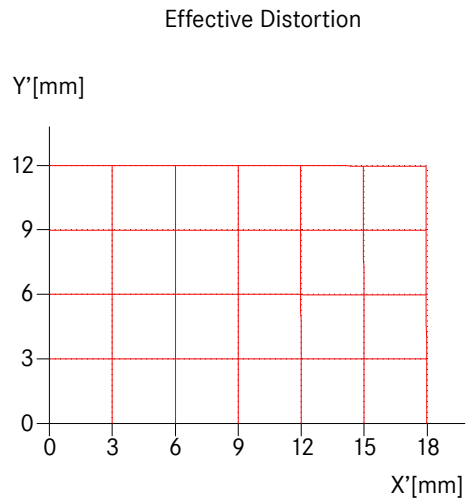
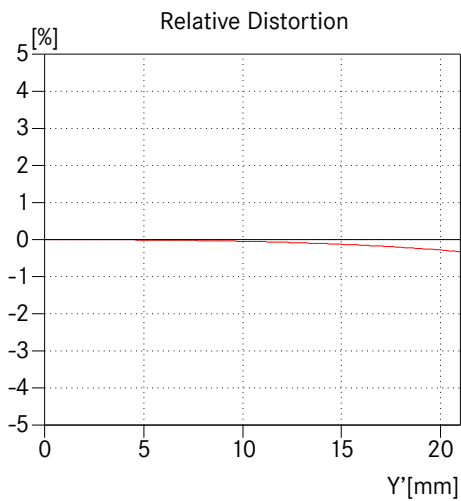
— MTF graphs



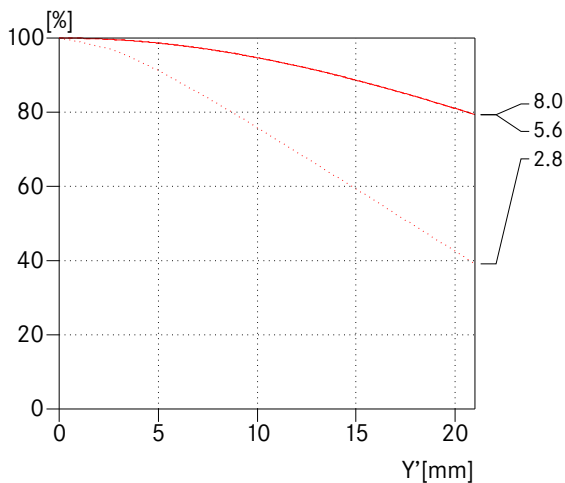
The MTF is indicated both at full aperture and at f/5.6 at long taking distances (infinity). Shown is the contrast in percentage for 5, 10, 20 and 40 lp/mm across the height of the 35 mm film format, for tangential (dotted line) and sagittal (solid line) structures, in white light. The 5 and 10 lp/mm will give an indication regarding the contrast ratio for large object structures. The 20 and 40 lp/mm records the resolution of finer and finest object structures.

- sagittal structures
- - - tangential structures

— Distortion



— Vignetting



Distortion is the deviation of the real image height (in the picture) from the ideal image height. The relative distortion is the percentage deviation. The ideal image height results from the object height and the magnification. The image height of 21.6mm is the radial distance between the edge and the middle of the image field for the format 24mm x 36mm. The graph of the effective distortion illustrates the appearance of straight horizontal and vertical lines in the picture.

Vignetting is a continuous decrease of the illumination to the edges of the image field. The graph shows the percentage lost of illumination over the image height. 100% means no vignetting.

- sagittal structures
- - - tangential structures



### — Depth of field table

| Distance Setting [m] | Aperture Stop |               |               |               |               |               |               | Magnification |
|----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|                      | 2,8           | 4             | 5,6           | 8             | 11            | 16            | 22            |               |
| 0,3                  | 0,299 - 0,301 | 0,298 - 0,302 | 0,298 - 0,302 | 0,297 - 0,304 | 0,295 - 0,305 | 0,293 - 0,307 | 0,291 - 0,310 | 1/2,66        |
| 0,35                 | 0,348 - 0,352 | 0,347 - 0,353 | 0,346 - 0,354 | 0,345 - 0,356 | 0,343 - 0,358 | 0,340 - 0,361 | 0,336 - 0,366 | 1/3,57        |
| 0,4                  | 0,397 - 0,403 | 0,396 - 0,404 | 0,395 - 0,405 | 0,392 - 0,408 | 0,390 - 0,411 | 0,385 - 0,416 | 0,380 - 0,423 | 1/4,44        |
| 0,5                  | 0,495 - 0,505 | 0,493 - 0,507 | 0,491 - 0,510 | 0,487 - 0,514 | 0,482 - 0,519 | 0,475 - 0,528 | 0,466 - 0,540 | 1/6,13        |
| 0,6                  | 0,593 - 0,607 | 0,590 - 0,610 | 0,586 - 0,615 | 0,580 - 0,621 | 0,574 - 0,629 | 0,562 - 0,644 | 0,550 - 0,662 | 1/7,79        |
| 1                    | 0,979 - 1,022 | 0,970 - 1,032 | 0,959 - 1,045 | 0,942 - 1,066 | 0,922 - 1,094 | 0,890 - 1,143 | 0,856 - 1,208 | 1/14,4        |
| 1,2                  | 1,169 - 1,233 | 1,156 - 1,247 | 1,140 - 1,268 | 1,115 - 1,299 | 1,087 - 1,341 | 1,043 - 1,417 | 0,994 - 1,522 | 1/17,6        |
| 2                    | 1,911 - 2,098 | 1,876 - 2,142 | 1,831 - 2,204 | 1,767 - 2,306 | 1,694 - 2,447 | 1,584 - 2,726 | 1,471 - 3,160 | 1/30,7        |
| 3                    | 2,800 - 3,231 | 2,725 - 3,338 | 2,629 - 3,496 | 2,497 - 3,763 | 2,350 - 4,163 | 2,141 - 5,061 | 1,935 - 6,844 | 1/47,0        |
| 5                    | 4,461 - 5,689 | 4,272 - 6,033 | 4,037 - 6,578 | 3,730 - 7,613 | 3,407 - 9,481 | 2,978 - 16,09 | 2,590 - 100,7 | 1/79,5        |
| ∞                    | 40,47 - ∞     | 28,68 - ∞     | 20,49 - ∞     | 14,36 - ∞     | 10,46 - ∞     | 7,205 - ∞     | 5,255 - ∞     | 1/∞           |

